Amendments to the Claims:

1. (Previously Presented) A method of producing xylose from a cellulose material containing hemicellulose, comprising:

providing a pre-hydrolyzed cellulose pulp that is at least partially bleached and has a hemicellulose content that is predominantly xylan;

extracting the hemicellulose from the at least partially bleached pulp into a caustic solution thereby forming a hemicaustic solution;

separating the hemicaustic solution into a concentrated hemicellulose solution and a concentrated caustic solution; and,

hydrolyzing the hemicellulose from the concentrated hemicellulose solution to produce xylose.

2. (Original) The method of claim 1, wherein the step of providing pulp comprises providing hardwood pulp wherein the pulp is greater than 4 wt% hemicellulose.

3. (Original) The method of claim 1, wherein the step of providing pulp comprises providing hardwood pulp where the hemicellulose is greater than 85 wt% xylan.

4. (Original) The method of claim 1, wherein the step of providing the at least partially bleached the pulp comprises providing a cooked cellulose pulp and subjecting the cooked pulp to a series of oxidation and extraction stages until greater than 80 wt% of the original lignin content of the pulp has been removed.

5. (Previously Presented) The method of claim 1, wherein the step of proving the at least partially bleached pulp comprises providing a cooked cellulose pulp and subjecting the cooked pulp to a series of oxidation and extraction stages until the pulp has an ISO brightness of 88% or higher.

6. (Original) The method of claim 1, wherein the step of extracting the hemicellulose from the pulp comprises extracting the hemicellulose using a cold caustic treatment.

7. (Original) The method of claim 6, wherein the pulp has a consistency of about 2 wt% to about 50 wt% with respect to the caustic solution during cold caustic treatment.

8. (Original) The method of claim 7, wherein the caustic solution has a pH greater than 13 during treatment.

9. (Original) The method of claim 8, wherein a temperature of the caustic solution is from about 20°C to about 50°C during treatment.

10. (Original) The method of claim 6, wherein the cold caustic treatment is continued until the treated pulp contains no more than 15 wt% hemicellulose.

11. (Original) The method of claim 10, wherein the cold caustic treatment is continued until the treated pulp contains no more than 5 wt% hemicellulose.

12. (Original) The method of claim 1, wherein the step of extracting the hemicellulose from the pulp into a caustic solution comprises holding the pulp in the caustic solution for a period of time and thereafter washing the pulp with water, wherein the caustic solution, extracted hemicellulose, and wash water form the hemicaustic solution.

13. (Original) The method of claim 1, wherein the step of separating the hemicaustic solution into a concentrated hemicellulose solution and a concentrated caustic solution comprises subjecting the hemicaustic solution to a separation technique selected from the group consisting of nanofiltration, distillation, centrifugation, and precipitation.

14. (Original) The method of claim 13, wherein the step of separating the hemicaustic solution comprises filtering the solution through a nanofiltration apparatus wherein the permeate stream exiting the nanofiltration apparatus is the concentrated caustic solution having greater than about 80 wt% of the original caustic solution, and wherein the concentrate stream is the concentrated hemicellulose solution that constitutes from about 5 wt% to about 30 wt% hemicellulose.

15. (Original) The method of claim 1, wherein the step of hydrolyzing the hemicellulose from the concentrated hemicellulose solution comprises

acidifying the concentrated hemicellulose solution with a mineral acid; and,

acid hydrolyzing the hemicellulose, whereby the xylan content of the hemicellulose is converted to xylose.

16. (Previously Presented) The method of claim 15, further comprising the step of demineralizing the acidified concentrated hemicellulose solution prior to the acid hydrolyzing step.

17. (Original) The method of claim 16, wherein the step of demineralizing is accomplished by filtration.

18. (Original) The method of claim 15, further comprising the step of demineralizing the concentrated hemicellulose solution prior to the acidifying step.

19. (Original) The method of claim 18, wherein the step of demineralizing is accomplished by ion exchange.

20. (Original) The method of claim 15, further comprising the step of removing organic/inorganic acids, metal salts, and colored by-products from the hydrolyzed hemicellulose.

21. (Original) The method of claim 20, wherein the step of removing acids, salts, and by-products from the hydrolyzed hemicellulose comprises contacting the hydrolyzed hemicellulose with a cationic ion exchange resin.

22. (Original) The method of claim 20, wherein the step of removing acids, salts, and by-products from the hydrolyzed hemicellulose comprises contacting the hydrolyzed hemicellulose with an anionic ion exchange resin.

23. (Original) The method of claim 1, wherein the resulting hydrolyzed hemicellulose has a xylose content of greater than 90 wt%.

24. (Original) The method of claim 1, wherein the step of providing a pulp comprises

providing a hardwood selected from sweet gum, black gum, maple, oak, eucalyptus, poplar, beech, aspen, and mixtures thereof;

digesting the hardwood to a hardwood pulp; and,

at least partially bleaching the digested pulp.

25. (Previously Presented) The method of claim 1, wherein the step of providing a pulp comprises

pre-hydrolyzing a hardwood feed material;

digesting the pre-hydrolyzed hardwood; and,

at least partially bleaching the digested pulp using a conventional pulp bleaching process.

26. (Previously Presented) A xylose production system comprising

a supply of at least partially bleached pre-hydrolyzed cellulose pulp having a hemicellulose content that is greater than 85 wt% xylan;

an alkaline treatment system capable of extracting hemicellulose from the bleached pulp into a hemicaustic solution;

a separation system capable of separating the hemicaustic solution into a purified concentrated caustic solution and a concentrated hemicellulose solution; and,

a hydrolysis unit capable of hydrolyzing the xylan content of the concentrated hemicellulose solution to xylose.

27. (Original) The xylose production system of claim 26, further comprising a chemical bleaching operation capable of providing the supply of at least partially bleached cellulose pulp by reducing the lignin content of a cooked hardwood pulp.

28. (Original) The xylose production system of claim 27, wherein the alkaline treatment system comprises:

a cellulose slurry supply system for providing the pulp containing hemicellulose to said alkaline treatment system;

a steeping liquor supply system for providing an effective amount of a caustic steeping liquor comprising an alkaline solution to said alkaline treatment system;

a mixing system for combining the pulp and the steeping liquor into an alkaline cellulose slurry;

at least one alkaline treatment unit for steeping the alkaline cellulose slurry for a sufficient amount of time to diffuse an effective amount of the hemicellulose out of the pulp fibers and into the steeping liquor thereby forming a hemicaustic solution; and,

at least one treated cellulose washer to separate the hemicaustic solution from the treated cellulosic fibers.

29. (Original) The xylose production system of claim 28, wherein the steeping liquor supply system further comprises at least one chiller.

30. (Original) The xylose production system of claim 26, wherein the separation system is a nanofiltration system.

31. (Previously Presented) The xylose production system of claim 30, wherein said nanofiltration system includes at least one nanofiltration membrane capable of excluding compounds having a molecular weight of about 200 Daltons and higher.

32. (Original) The xylose production system of claim 31, wherein said nanofiltration system comprises a plurality of nanofiltration units.

33. (Original) The xylose production system of claim 32, wherein said nanofiltration system further comprises an evaporation system.

34. (Original) The xylose production system of claim 26, wherein the hydrolysis unit comprises:

a demineralization stage for reducing alkali content of the hemicellulose solution;

an acidification stage for introducing a mineral acid to the hemicellulose solution; and,

a hydrolysis reactor to hydrolyze hemicellulose.

35. (Currently Amended) A process for producing a xylose product from a cellulose material, comprising the steps of:

at least partially chemically bleaching a cooked <u>pre-hydrolized</u> cellulose pulp using a conventional pulp bleaching process;

using a cold caustic treatment to extract hemicellulose from the at least partially bleached cellulose pulp into a caustic solution thereby forming a hemicaustic solution;

separating the hemicaustic solution by nanofiltration into a concentrated hemicellulose solution and a concentrated caustic solution; and,

hydrolyzing the hemicellulose from the concentrated hemicellulose solution.

36. (Original) The process of claim 35, wherein the step of providing a cellulose pulp comprises providing a hardwood pulp wherein the hardwood is greater than 5 wt% hemicellulose.

37. (Original) The process of claim 36, wherein the hemicellulose of the hardwood is greater than 85 wt% xylan.

38. (Previously Presented) The process of claim 35, wherein the at least partially bleached pulp has an ISO brightness of 88% or higher.

39. (Original) The process of claim 35, wherein the cold caustic treatment is continued until the treated pulp contains no more than 15 wt% hemicellulose.

40. (Original) The process of claim 39, wherein the cold caustic treatment is continued until the treated pulp contains no more than 5 wt% hemicellulose.

41. (Original) The process of claim 35, wherein the step of nanofiltering the hemicaustic solution comprises filtering the solution through a nanofiltration apparatus wherein the permeate stream exiting the nanofiltration apparatus is the concentrated caustic solution having greater than about 80 wt% of the original caustic solution, and wherein the concentrate

stream is the concentrated hemicellulose solution that constitutes from about 5 wt% to about 30 wt% hemicellulose.

42. (Original) The process of claim 35, wherein the step of hydrolyzing the hemicellulose from the concentrated hemicellulose solution comprises

neutralizing the concentrated hemicellulose solution with a mineral acid; and,

acid hydrolyzing the hemicellulose, whereby the xylan content of the hemicellulose is converted to xylose.

43. (Previously Presented) The method of claim 35, further comprising the step of acidifying the concentrated hemicellulose solution prior to the hydrolyzing step.

44. (Previously Presented) The method of claim 42, further comprising the step of demineralizing the concentrated hemicellulose solution prior to the acid hydrolyzing step.

45. (Original) The process of claim 42, further comprising the step of removing organic/inorganic acids, metal salts, and colored by-products from the hydrolyzed hemicellulose.

46. (Original) The process of claim 35, wherein the resulting hydrolyzed hemicellulose has a xylose content of greater than 90 wt%.

47. (Previously Presented) The method of claim 6, wherein a temperature of the caustic solution is less than 50°C during treatment.

48. (Previously Presented) A method of producing xylose from a cellulose material containing hemicellulose, comprising:

providing a cellulose pulp that is at least partially bleached and has a hemicellulose content that is predominantly xylan;

extracting the hemicellulose from the at least partially bleached pulp into a caustic solution thereby forming a hemicaustic solution;

separating the hemicaustic solution into a concentrated hemicellulose solution and a concentrated caustic solution; and,

hydrolyzing the hemicellulose from the concentrated hemicellulose solution to produce a xylose product having a purity of 80 wt% or greater in the absence of an additional purification step.